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Update on Global Developments in Nuclear Energy

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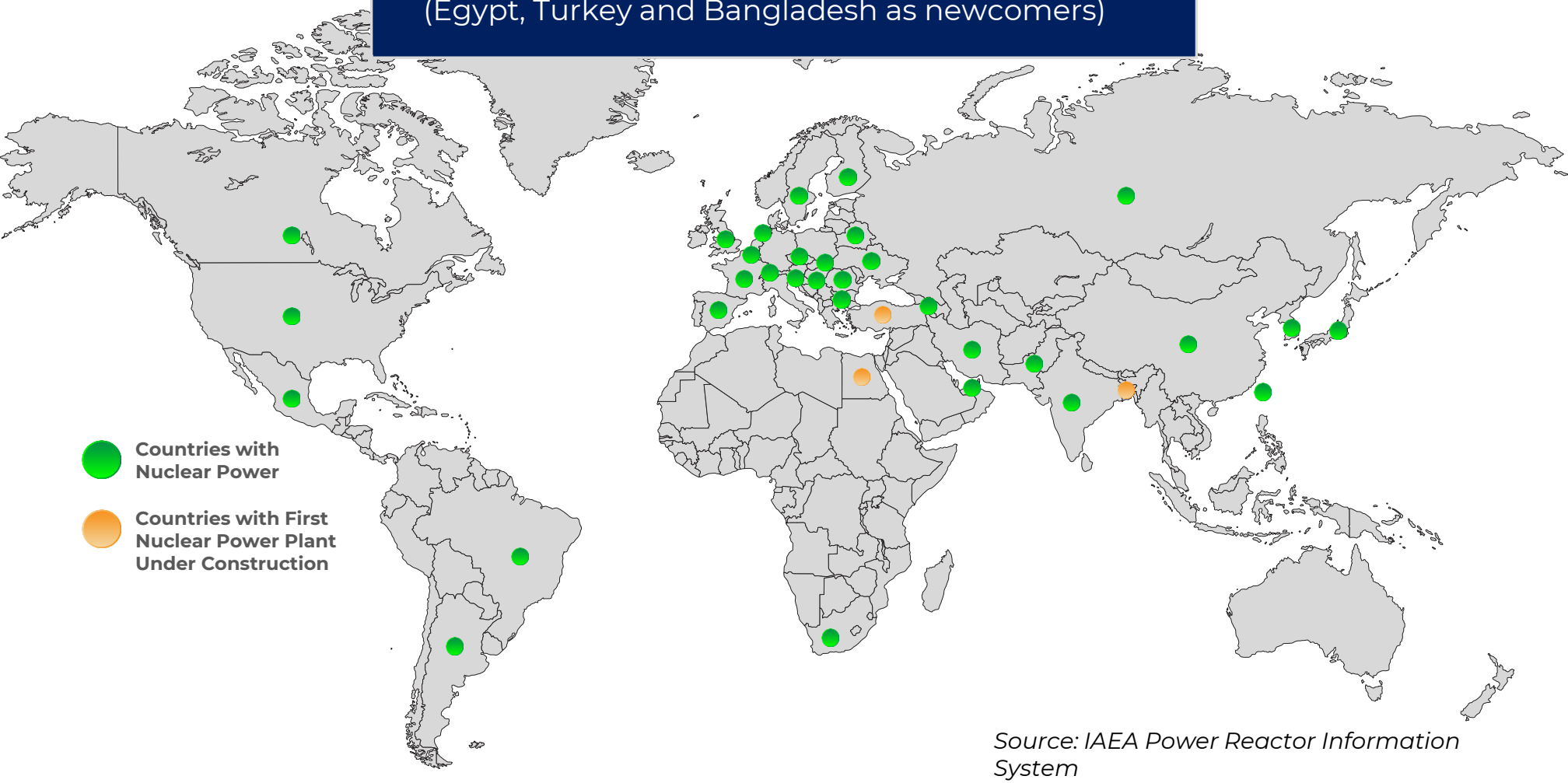
October 2024

Status of nuclear energy in the world

- 32 countries operating 415 reactors
- 62 reactors under construction in 15 countries (Egypt, Turkey and Bangladesh as newcomers)



Source: IAEA Power Reactor Information System

Status of nuclear energy in the world (cont.)

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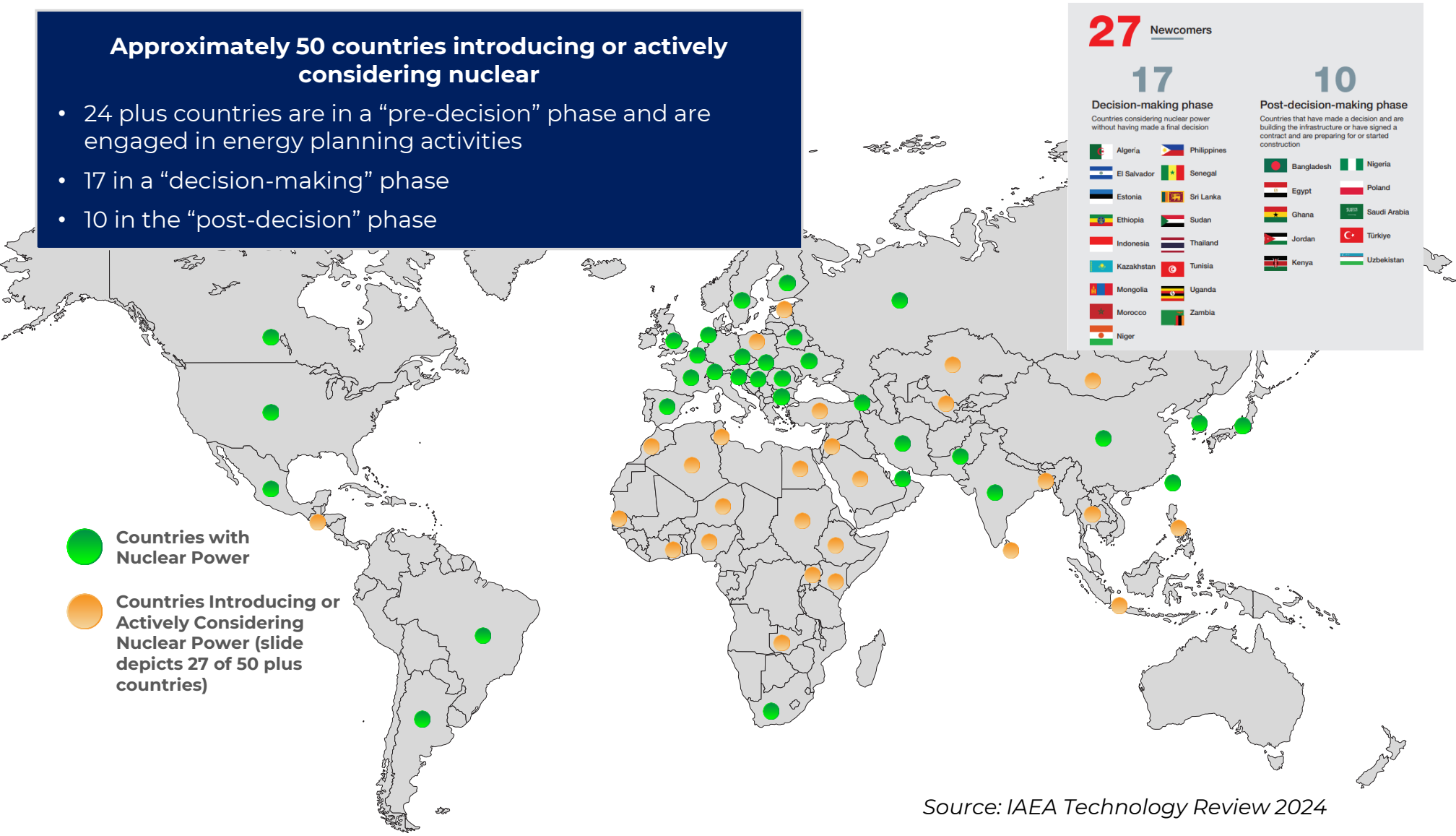
Approximately 50 countries introducing or actively considering nuclear

- 24 plus countries are in a “pre-decision” phase and are engaged in energy planning activities
- 17 in a “decision-making” phase
- 10 in the “post-decision” phase

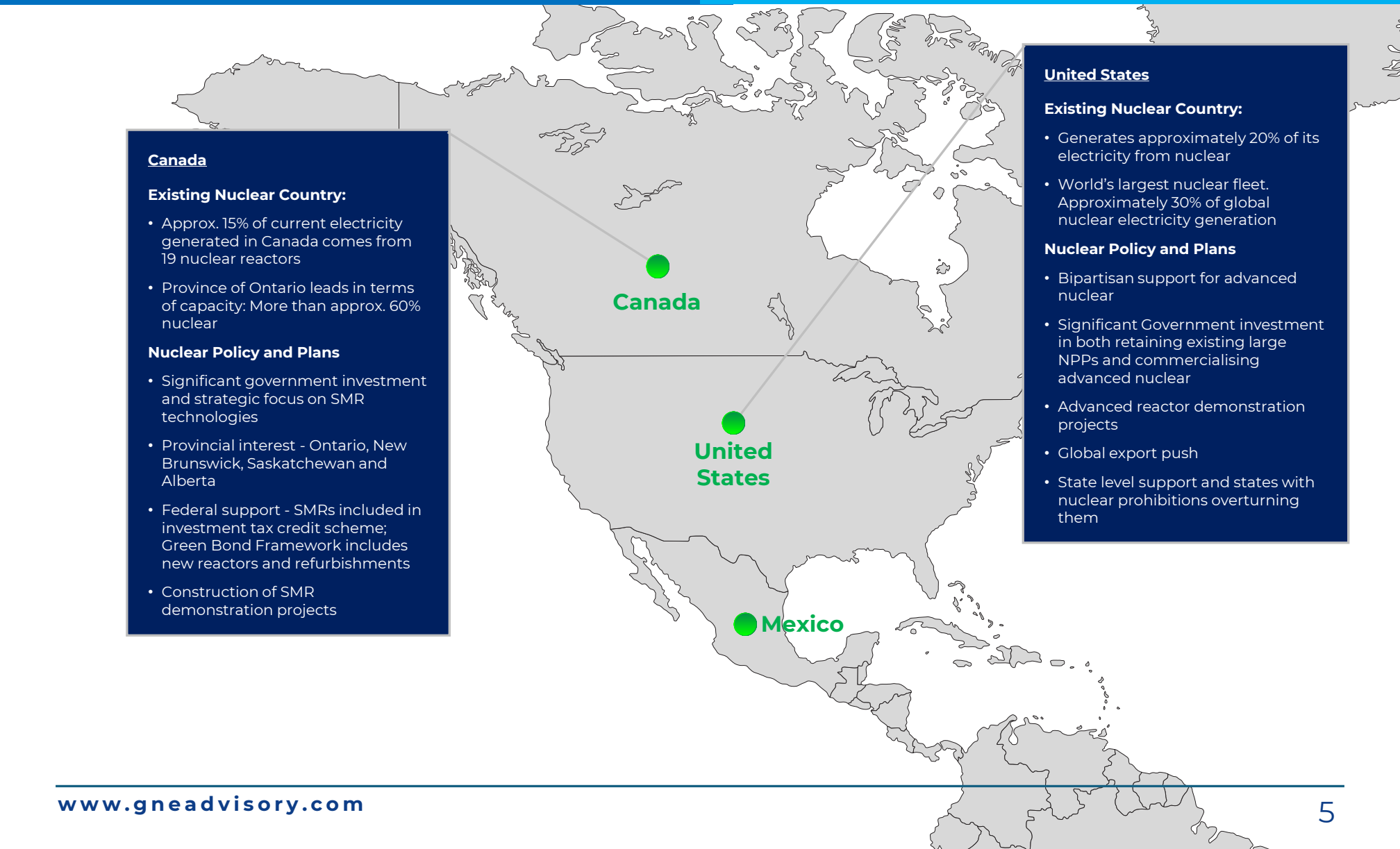


Source: IAEA Technology Review 2024

COP28 –Triple nuclear pledge

- 22 countries endorsed a pledge recognising the key role of nuclear energy in achieving global net-zero greenhouse gas emissions by 2050 and Sustainable Development Goal 7 (Ensure access to affordable, reliable, sustainable and modern energy for all)
- . The pledge includes:
  - *Commitment to advancing a global aspirational goal of tripling nuclear energy capacity from 2020 by 2050;*
  - *Commitment to mobilize investments in nuclear power; Invite shareholders of the World Bank, international financial institutions, and regional development banks to encourage the inclusion of nuclear energy in their lending policies as needed;*
  - *Commitment to supporting the development and construction of nuclear reactors, such as SMRs, for power generation as well as industrial applications for decarbonization;*
  - *Recognize the importance of extending the lifetimes of NPPs as appropriate;*
  - *Commitment to supporting responsible nations looking to explore new civil nuclear deployment under the highest standards of safety, sustainability, security, and non-proliferation.*
- 25 endorsing countries: Armenia, Bulgaria, Canada, Croatia, Czech Republic, Finland, France, Ghana, Hungary, Jamaica, Japan, Republic of Korea, Moldova, Mongolia, Morocco, Netherlands, Poland, Romania, Slovakia, Slovenia, Sweden, Ukraine, United Arab Emirates, and United Kingdom, United States
- April 2024: First global nuclear summit at Head of State level
- April 2024: G7 nations commit to support the use of nuclear energy in countries that choose to use it

North America



Canada

Existing Nuclear Country:

- Approx. 15% of current electricity generated in Canada comes from 19 nuclear reactors
- Province of Ontario leads in terms of capacity: More than approx. 60% nuclear

Nuclear Policy and Plans

- Significant government investment and strategic focus on SMR technologies
- Provincial interest - Ontario, New Brunswick, Saskatchewan and Alberta
- Federal support - SMRs included in investment tax credit scheme; Green Bond Framework includes new reactors and refurbishments
- Construction of SMR demonstration projects

United States

Existing Nuclear Country:

- Generates approximately 20% of its electricity from nuclear
- World's largest nuclear fleet. Approximately 30% of global nuclear electricity generation

Nuclear Policy and Plans

- Bipartisan support for advanced nuclear
- Significant Government investment in both retaining existing large NPPs and commercialising advanced nuclear
- Advanced reactor demonstration projects
- Global export push
- State level support and states with nuclear prohibitions overturning them

Europe

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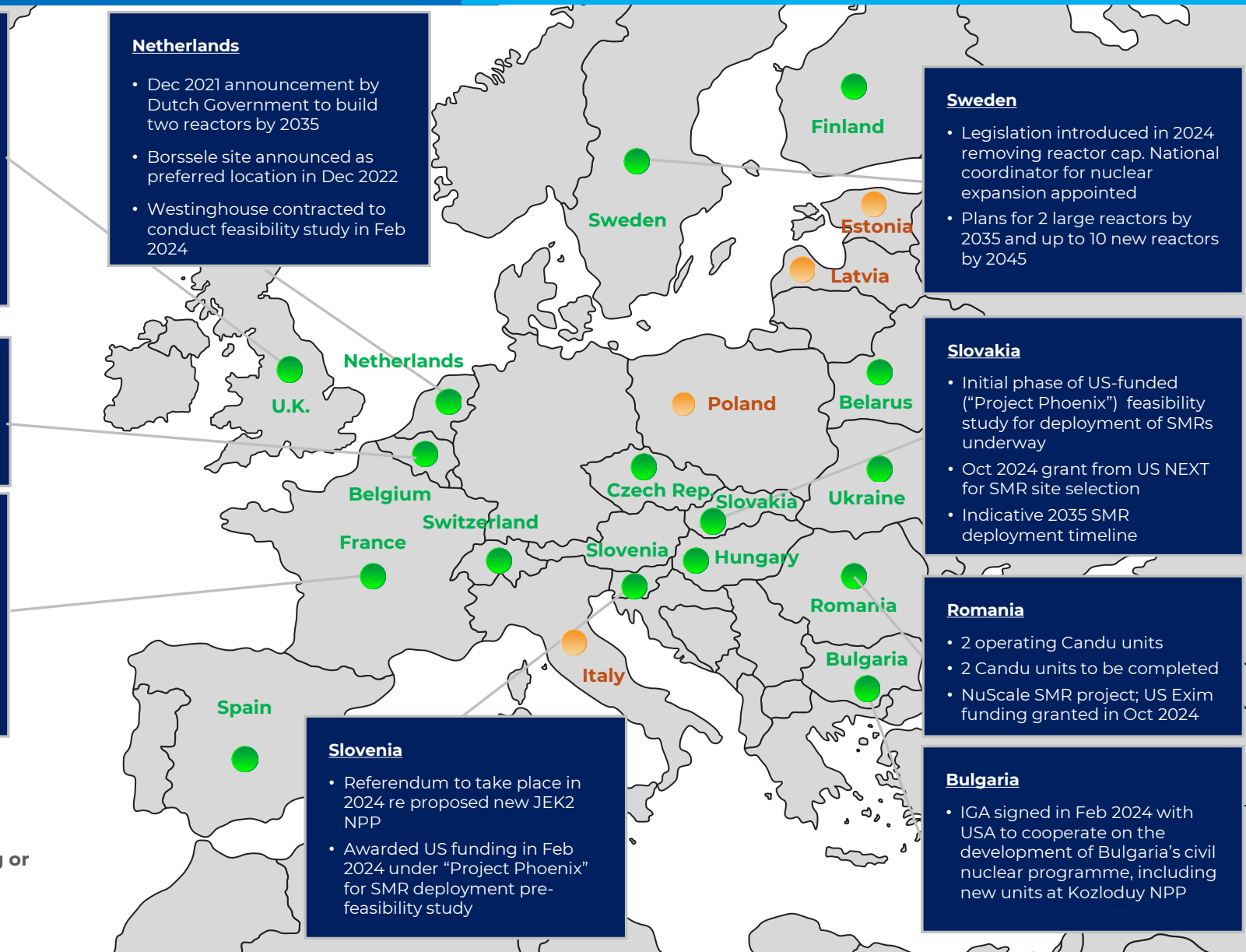


United Kingdom

- Old fleet – retiring
- British Energy Security Strategy released in Jan 2024 establishes government ambition for tripling current nuclear capacity by 2050
- New builds: Hinkley Point C; Sizewell C; Bradwell B?
- Great British Nuclear

Belgium

- Life extension plans for existing fleet (Doel 5 and Tihange 3)
- SMR plans

France

- 62% of total electricity generated from 56 reactors
- Pledge from President Macron in Feb 2022 to build 14 new reactors, immediate goal of six new EPR-1 reactors by 2035
- Commercialising SMR design

Countries with Nuclear Power

Countries Introducing or Actively Considering Nuclear Power

Netherlands

- Dec 2021 announcement by Dutch Government to build two reactors by 2035
- Borssele site announced as preferred location in Dec 2022
- Westinghouse contracted to conduct feasibility study in Feb 2024

Slovenia

- Referendum to take place in 2024 re proposed new JEK2 NPP
- Awarded US funding in Feb 2024 under "Project Phoenix" for SMR deployment pre-feasibility study

Sweden

- Legislation introduced in 2024 removing reactor cap. National coordinator for nuclear expansion appointed
- Plans for 2 large reactors by 2035 and up to 10 new reactors by 2045

Slovakia

- Initial phase of US-funded ("Project Phoenix") feasibility study for deployment of SMRs underway
- Oct 2024 grant from US NEXT for SMR site selection
- Indicative 2035 SMR deployment timeline

Romania

- 2 operating Candu units
- 2 Candu units to be completed
- NuScale SMR project; US Exim funding granted in Oct 2024

Bulgaria

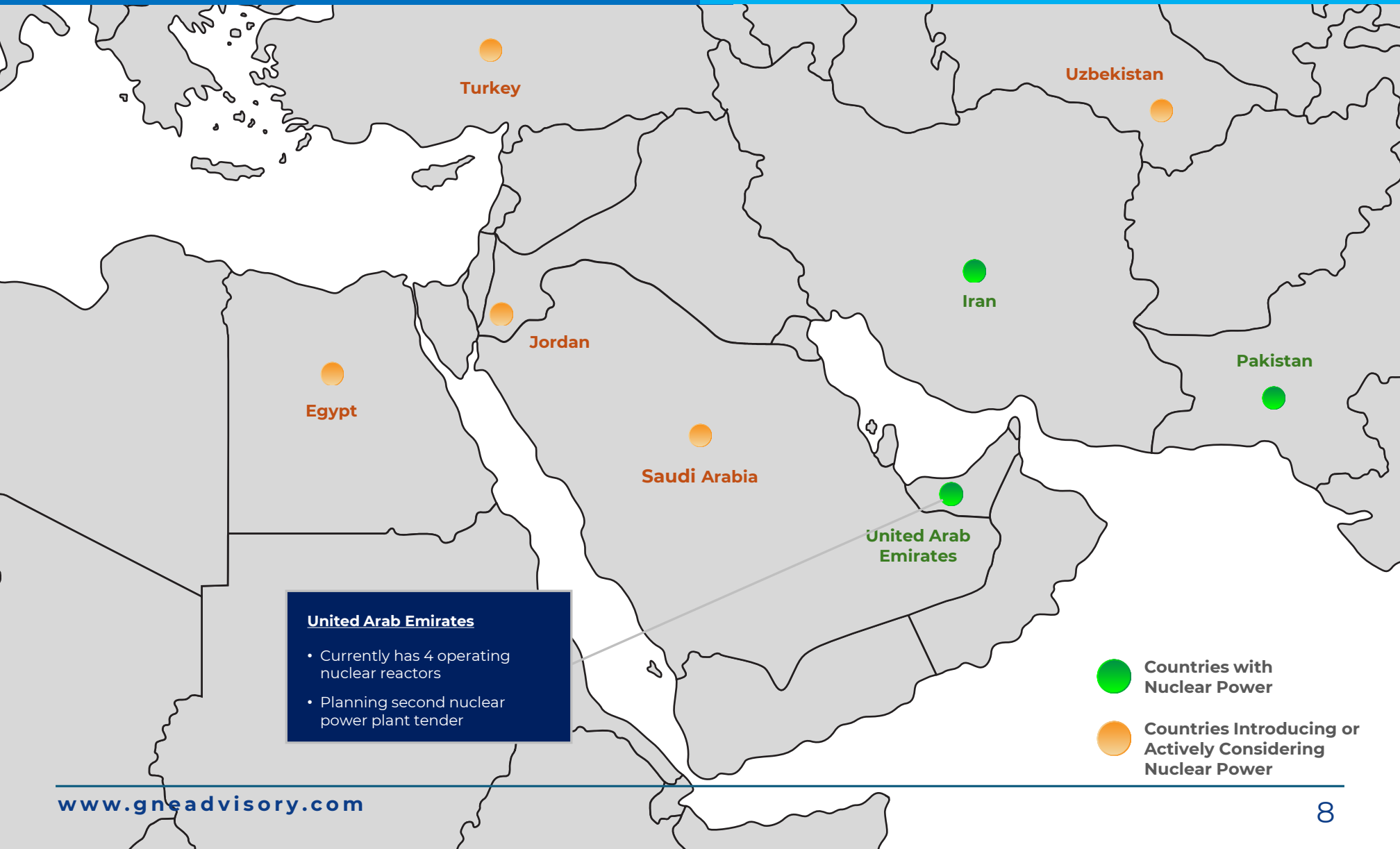
- IGA signed in Feb 2024 with USA to cooperate on the development of Bulgaria's civil nuclear programme, including new units at Kozloduy NPP

Africa

South Africa

- Currently has 2 operating nuclear reactors
- Potential procurement of 2,500 Mwe of new capacity

Middle East / Central Asia



Asia and Southeast Asia

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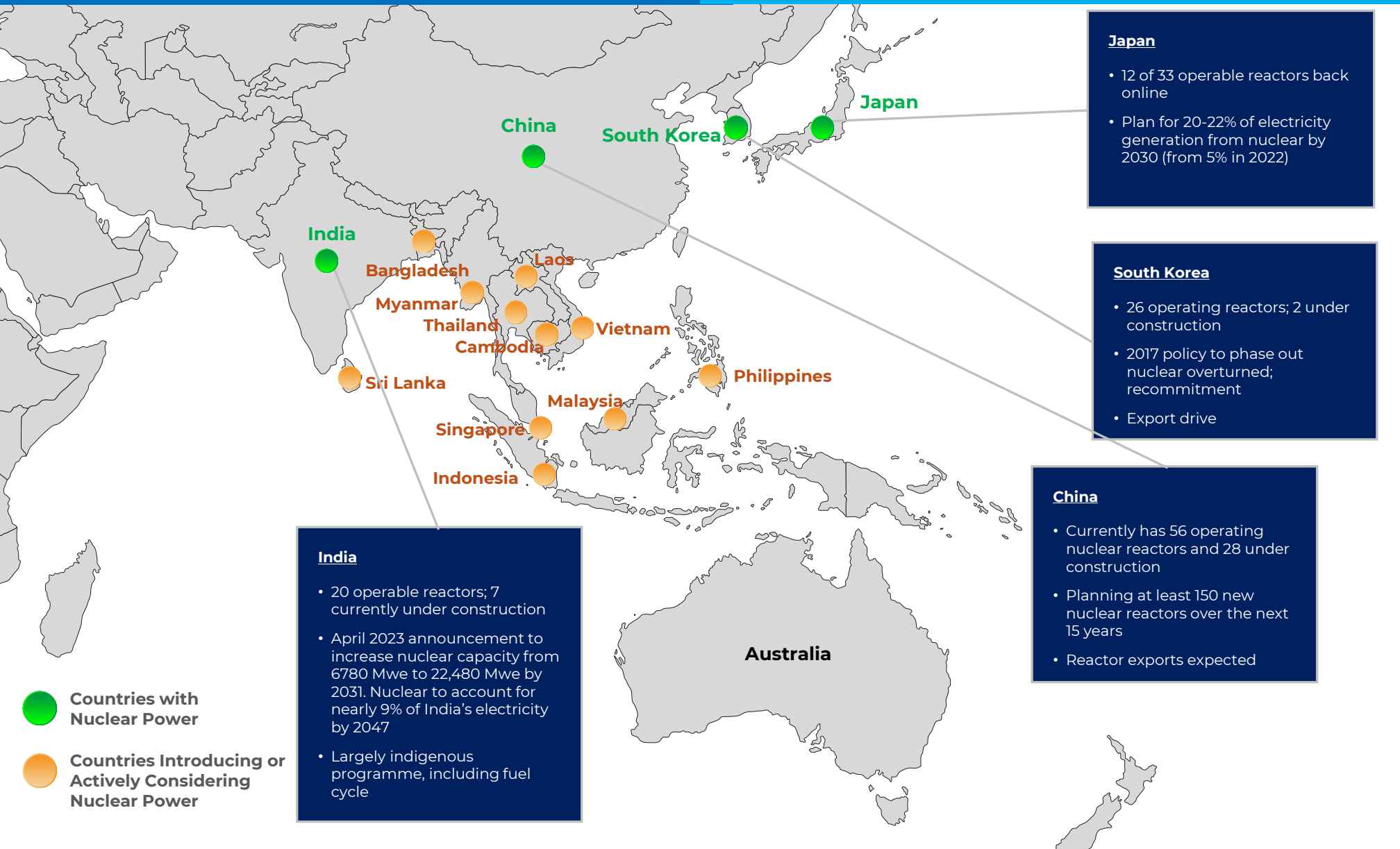

Japan

- 12 of 33 operable reactors back online
- Plan for 20-22% of electricity generation from nuclear by 2030 (from 5% in 2022)

South Korea

- 26 operating reactors; 2 under construction
- 2017 policy to phase out nuclear overturned; recommitment
- Export drive

China

- Currently has 56 operating nuclear reactors and 28 under construction
- Planning at least 150 new nuclear reactors over the next 15 years
- Reactor exports expected

India

- 20 operable reactors; 7 currently under construction
- April 2023 announcement to increase nuclear capacity from 6780 Mwe to 22,480 Mwe by 2031. Nuclear to account for nearly 9% of India's electricity by 2047
- Largely indigenous programme, including fuel cycle

Countries with Nuclear Power

Countries Introducing or Actively Considering Nuclear Power

Key take-aways

- There is unprecedented global support for nuclear energy - life extensions and refurbishments as well as newbuild of existing and new technologies
- Drivers are a growing recognition that nuclear energy is a necessary component of a decarbonised energy system and a desire to ensure energy security
- Common theme is the central role of government in leading and driving developments
- Australia is in a broader region that is going nuclear
- Nuclear energy is not an overnight proposition – having all low carbon options available means starting now